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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,006	08/03/2006	Takashi Kato	P29806	6588

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EXAMINER
PARKER, JEFFREY ALAN

ART UNIT	PAPER NUMBER
4147	

NOTIFICATION DATE	DELIVERY MODE
07/23/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/578,006	KATO, TAKASHI	
	Examiner	Art Unit	
	JEFFREY PARKER	4147	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 May 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/10/06, 2/25/08, 1/30/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Figure 9 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 7-10 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a process, machines, manufactures and composition of matter asserted utility or a well established utility.

Claims 7 and 8 claim “a program of instructions.” However, claims 7 and 8 do not define “a program of instructions” to be functionally descriptive material encoded on a memory/disk, see Applicant’s specification, page 21, last paragraph to page 22, and is thus non-statutory. Additionally, “a program of instructions” is neither a process (“action”, i.e., transform underlying claimed subject matter to a different state or thing), nor machine (not tied to another statutory class, such as a particular apparatus), nor manufacture, nor composition of matter (i.e., tangible "thing") and is therefore non-statutory. As such, a program of instructions **or software** (functional descriptive material) per se not claimed as embodied/encoded in computer-readable media is not statutory for that reason (i.e., “When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized”). Software by itself is not capable of causing functional change in the computer (transform underlying claimed subject matter to a different state or thing), nor machine (not tied to another statutory class, such as a particular apparatus), nor manufacture, nor composition of matter (i.e., tangible “thing”) and therefore non-statutory.

While the claims recite series of steps or acts to be performed, a statutory “process” under 35 U.S.C. 101 must (1) be tied to particular machine, or (2) transform underlying subject matter (such as an article or material) to a different state or thing. See page 10 of In Re Bilski 88 USPQ2d 1385.

The instant claims are neither positively tied to a particular machine that accomplishes the claimed method steps nor transform underlying subject matter, and therefore do not qualify as a statutory process.

Because the full scope of claims 7 and 8 as properly read in light of the disclosure encompasses non-statutory subject matter, the claim as a whole is non-statutory under the present USPTO Interim Guidelines, 1300 Official Gazette Patent and Trademark Office 142 (Nov. 22, 2005). Any amendment to the claim shall commensurate with its corresponding disclosure.

Claims 9 and 10 claim "a computer readable medium." However, claims 9 and 10 do not **clearly** define "a computer readable medium" to be functionally descriptive material encoded on a memory/disk, see Applicant's specification, page 21, last paragraph to page 22, and is thus non-statutory. Additionally, "a computer readable medium" is neither a process ("action", i.e., transform underlying claimed subject matter to a different state or thing), nor machine (not tied to another statutory class, such as a particular apparatus), nor manufacture, nor composition of matter (i.e., tangible "thing") and is therefore non-statutory.

Because the full scope of claims 9 and 10 as properly read in light of the disclosure encompasses non-statutory subject matter, the claim as a whole is non-statutory under the present USPTO Interim Guidelines, 1300 Official Gazette Patent

and Trademark Office 142 (Nov. 22, 2005). Any amendment to the claim shall commensurate with its corresponding disclosure.

Claims 8-10 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported **by either a physical "thing", a well asserted utility or a well established utility** for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1, 2, 3, 5, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **European Patent Application EP 1,120,944 to McVey** in view of **U.S. Patent 5,228,062 to Bingham**.

As per claim 1, McVey teaches a quadrature modulation apparatus (**Fig. 1**) comprising: an in-phase signal means (**mixer 38, paragraph [0020]**) that outputs an in-phase conversion signal (signal from **mixer 38** to **summer 40, paragraph [0020]**) by mixing an in-phase local signal of a predetermined local frequency (signal from **oscillator 34** to **mixer 38, paragraph [0020]**) with an in-phase correction user signal (**I signal 25, paragraph [0020]**) obtained by adding (**summer 80, paragraph [0029]**) an in-phase user signal (**I digital datastream 117, paragraph [0029]**) to an in-phase correction signal (**I OFFSET, paragraph [0029] and [0037]**) **…**; a quadrature signal converter (**mixer 42, paragraph [0020]**) that outputs a quadrature conversion signal (signal from **mixer 42** to **summer 40, paragraph [0020]**) by mixing a quadrature local signal (signal from **oscillator 34** to **mixer 42, paragraph [0020]**) which is different in phase by 90 degrees from the in-phase local signal (see phase adjustment of 90 degrees by **ninety degree splitter 36, paragraph [0020]**), with a quadrature correction user signal (**Q signal 21C, paragraph [0029]**) obtained by adding (**summer 88, paragraph [0029]**) a quadrature user signal (**I digital datastream 121, paragraph [0029]**) to a quadrature correction signal (**Q OFFSET, paragraph [0029] and [0037]**), which is different in phase by 90 degrees from the in-phase correction signal (Because the signal the Q OFFSET is modifying is offset from the I signals by 90 degrees, one of

ordinary skill in the art would appreciate that although not explicitly stated, the Q OFFSET would be 90 degrees different from the I OFFSET signal above); an adder that adds the in-phase conversion signal to the quadrature conversion signal (**summer 40, paragraph [0020]**); an output voltage measurer that measures an output voltage of said adder (**Amplitude Detector 44**, see **paragraph [0021]** which discusses detecting the magnitude of the **modulated output signal 12** with circuitry that includes an analog-to-digital converter, which detects voltage and outputs a digital representation of that voltage); and an error determiner that determines an error of the quadrature modulation based upon the measurement result of said output voltage measurer (**IQ Correction Code 46,146**, see **paragraphs [0037]-[0043]**).

McVey does not teach [mixing an in-phase local signal of a predetermined local frequency with an in-phase correction user signal obtained by adding an in-phase user signal to an in-phase correction signal] of a sinusoidal voltage.

However, Bingham teaches [mixing an in-phase local signal of a predetermined local frequency with an in-phase correction user signal obtained by adding an in-phase user signal to an in-phase correction signal] of a sinusoidal voltage (see **column 7, line 46 to column 8, line 9** discussing after calculating amplitude and phase errors, to apply a lookup table to sinewave generators 100 and 105 that serve to create a complex correcting signal with a sinusoidal voltage).

It would have been obvious to a person having ordinary skill in the art to combine the sinusoidal correcting signal of Bingham with the quadrature modulation apparatus of

McVey. The motivation would be to correct the sinusoidal I modulation signal for errors in a feedback loop.

As per claim 2, McVey in view of Bingham teaches the quadrature modulation apparatus according to claim 1. McVey teaches wherein said error determiner measures the error of the quadrature modulation based upon a relationship of the output voltage of said adder with respect to the phase of the in-phase correction signal or the quadrature correction signal (see **paragraph [0039]**).

As per claim 3, McVey in view of Bingham teaches the quadrature modulation apparatus according to claim 1. McVey teaches wherein said error determiner determines an error relating to an amplitude (see amplitude detector and discussion in **paragraphs [0037]** relating to magnitude and I/Q gain error), an orthogonality (quadrature error discussed in **paragraphs [0037]-[0039]** as orthogonality is the 90 degree separation between the I and Q carriers), and an offset of the in-phase user signal and the quadrature user signal (**paragraph [0039]** discussing calculating the I/Q phase error between the I modulation component and the Q modulation component using a history of the output signal).

As per claim 5, claim 5 (method) is analyzed with respect to claim 1 (apparatus); See rejection of claim 1 above.

As per claim 7, claim 7 is directed towards the embodiment of the apparatus of claim 1 in a "program of instructions". It would have been obvious to embody the procedures of McVey in view of Niwa et al. discussed with respect to claim 1 in a "program of instructions" in order that the instructions could be automatically performed by a processor (Further, McVey, **paragraph [0030]**, discusses that the modulation technique of claim 1 is performed with a microprocessor and memory).

As per claim 9, claim 9 is directed towards the embodiment of the apparatus of claim 1 in a "computer readable medium". It would have been obvious to embody the procedures of McVey in view of Niwa et al. discussed with respect to claim 1 in a "computer readable medium" in order that the instructions could be automatically performed by a processor (Further, McVey, **paragraph [0030]**, discusses that the modulation technique of claim 1 is performed with a microprocessor and memory).

3. Claims 4, 6, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **European Patent Application EP 1,120,944 to McVey** in view of **U.S. Publication 2005/0169402 to Niwa et al.**.

As per claim 4, McVey teaches a quadrature modulation apparatus (**Fig. 1 and 3**) comprising: a signal means that outputs a conversion signal (mixer 38 outputting a signal to summer 40) by mixing a local signal of a predetermined local frequency (signal from oscillator 34 to mixer 38) with an offset user signal (25A) obtained by adding a DC

voltage signal to a user signal (**Summer 38** adds the I signal 25 with the **I OFFSET**, a DV signal as discussed in **paragraph [0034]**); an output voltage measurer that measures a voltage of the conversion signal (**Amplitude Detector 44**, see **paragraph [0021]** which discusses detecting the magnitude of the modulated output signal 12 with circuitry that includes an analog-to-digital converter, which detects voltage and outputs a digital representation of that voltage).

McVey does not teach and an optimum voltage decider that decides an optimum voltage such that the voltage measured by said output voltage measurer is minimum.

However, Niwa et al. teaches and an optimum voltage decider that decides an optimum voltage such that the voltage measured by said output voltage measurer is minimum (see **Figs. 2 and 5** and **paragraphs [0059], [0061], [0062], and [0067]** discussing a process of detecting a DC offset and determining the optimum voltage to subtract from the signal to eliminate, ie. minimize, the dc offset. See also **paragraph [0006]**).

It would have been obvious to a person having ordinary skill in the art to combine the dc offsetting technique of Niwa et al. with the quadrature modulation apparatus of McVey. The motivation would be to minimize the dc offset and thus the carrier leak in the QAM modulated signal (see **paragraph [0004]**).

As per claim 6, claim 6 (method) is analyzed with respect to claim 4 (apparatus); See rejection of claim 4 above.

As per claim 8, claim 8 is directed towards the embodiment of the apparatus of claim 4 in a "program of instructions". It would have been obvious to embody the procedures of McVey in view of Niwa et al. discussed with respect to claim 4 in a "program of instructions" in order that the instructions could be automatically performed by a processor (Further, McVey, **paragraph [0030]**, discusses that the modulation technique of claim 1 is performed with a microprocessor and memory).

As per claim 10, claim 10 is directed towards the embodiment of the apparatus of claim 4 in a "computer readable medium". It would have been obvious to embody the procedures of McVey in view of Niwa et al. discussed with respect to claim 4 in a "computer readable medium" in order that the instructions could be automatically performed by a processor (Further, McVey, **paragraph [0030]**, discusses that the modulation technique of claim 1 is performed with a microprocessor and memory).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY PARKER whose telephone number is (571)270-5161. The examiner can normally be reached on M-T 8:30-6:00, every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hai Tran can be reached on 5712727305. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JAP/
07/20/2009
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